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26 February 1958

MEMORANDUM FOR: [REDACTED]

ATTENTION :

SUBJECT :

REFERENCE :

1. Recent tests performed by the undersigned on the wire analyzer recently supplied to APD have disclosed both merits and defects of the unit. The major defects of the unit are its form factor, packaging, and wiring layout. These matters will be taken up in subsequent paragraphs. In brief, the unit performed as follows:

Electrical Performance:

1. Oscillator Check: Power output and frequency range proved to be satisfactory. (10 mw; 100 cps to 1 mcs)

2. Resonant Frequency Check and microphone readout tests were also satisfactory. Microphone readout was obtained on over 1500 feet of No. 38 twisted pair former at a frequency of 2000 cycles. This test included MC-14, BA, and shoe heel microphones. Other microphone readout checks using the same microphones were made over 60 feet of drop cord and also proved satisfactory. The following items were easily detected using the resonant frequency technique.

- a. ST 2A Transmitters
- b. TLDC Unit
- c. PAT Unit

The Motorola Carrier Unit proved extremely difficult to find since the filters of the carrier unit on hand are tuned between 170 and 175 Kc. The difficulty arose in that the oscillator itself appears to be resonant at 160 Kc when the matching transformer is set on 600 ohms. (SEE attached curves). This may be due to the wiring within the analyzer unit, since the haphazard wiring technique used in the construction leaves much to be desired. This apparent resonant frequency of the oscillator should be thoroughly investigated and eliminated. It may also be that a substitute oscillator unit will be required.

1. DC Voltage:

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1. DC Voltage: The power supply furnished with the unit performed very well for the DC voltage check. It could be easily ascertained when the carbon microphones were terminated at the end of a line. It was determined in the course of tests performed for this function that a DC milliammeter with a range up to 100 milliamps is sufficient. It was also ascertained that a DC voltmeter with a range up to 300 volts is sufficient.

2. AC Voltage Check: This particular function of the unit could not be properly tested because as soon as an AC voltage check was attempted, a resistor within the unit went up in smoke. Hence, the undersigned has no way of knowing how well the unit would have worked for this function. Apparently a common ground point came loose within the unit, but the jungle of wires made circuit tracing extremely difficult. The unit is being returned to TEL with this tie point left dangling and the burnt out resistor still in place. It was also necessary to unsolder one lead to the burnt out resistor in order to drop the back cover. This wire has been left unsoldered.

3. RMS Voltmeter: It was found that the Heath Kit Voltmeter installed in the unit has sufficient sensitivity on all ranges to perform well throughout all tests made. NOTE: All resonant frequency checks using this meter were made with maximum output from the oscillator and the appropriate ranges set on the voltmeter..

4. Physical Construction and Packaging: It is felt by all persons concerned with this project that although the unit performed well electrically, some repackaging must be done prior to demonstration of the unit to the ultimate user. In accordance with this, a sketch is hereby attached proposing a front panel layout for the unit. The items to be mounted on a single front panel are as follows:

1. Heath Kit Voltmeter - meter and range switch only to protrude through panel.
2. DC Voltmeter - to be obtained by TEL
3. DC Milliammeter - furnished by APD
4. AC Milliammeter - furnished by APD
5. Fuse
6. Function Switch
7. Variac Control
8. Phone Jack

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8. Phone Jack
9. Line Terminals
10. Push Button*
11. On - Off Switch

12. Pilot Light (not required but considered useful to determine if power is being supplied to the unit) *NOTE: The present push button is not easily adaptable for use with the unit. It is suggested that an alternative spring loaded toggle switch be used in its place. If possible, a switch should be used which will spring return in one position and lock in another position, in order to make spot-check readings or continuously monitor a function. The oscillator may or may not be mounted on the same front panel. However, the only controls of the oscillator unit which should protrude or be displayed are the master dial, frequency multiplying switch and matching transformer output selector switch. The suggested layout for all components is shown on the attached sketch with approximate dimensions shown. It is also requested that if possible all control switches be stenciled, designating their functions and that the meters be labeled Meter #1, 2, 3, and 4 as follows:

- a. RMS Volts - #1
- b. AC ma - #2
- c. DC volts - #3
- d. DC ma #4

It is also requested that a considerably smaller number of screws be required to remove the cover rather than the ridiculous quantity of 24 presently required.

Per the referenced phone conversation, TSL should proceed to obtain a Triplet Voltmeter 0 to 300 volts DC, model 221, for use with this unit.


It is felt

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It is felt by the undersigned that this repackaging of the unit should not require more than two weeks time; therefore, it is requested that the modified unit be returned to APD for further testing on or before 14 March 1958. For any further information contact the undersigned on extension .

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APPROVED:



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